

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-13 (canceled)

14. (original) An isolated DNA having the nucleotide sequence shown by SEQ ID NO: 2.

Claims 15-20 (canceled)

21. (original) A recombinant DNA vector comprising the DNA according to claim 14.

22. (original) A transformant obtained by introducing the recombinant DNA vector according to claim 21 into a host cell.

23. (original) The transformant according to claim 22, wherein the transformant belongs to a microorganism selected from the genera *Escherichia*, *Bacillus*, *Corynebacterium*, and *Streptomyces*.

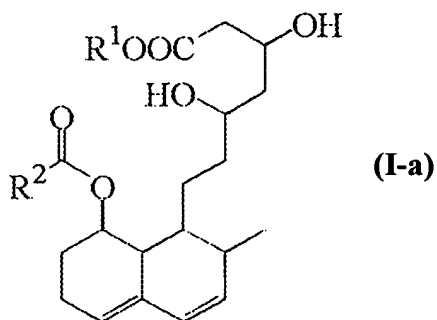
24. (previously presented) The transformant according to claim 22, wherein the transformant belongs to microorganism selected from *Escherichia coli*, *Bacillus subtilis*, *Bacillus megaterium*, *Corynebacterium glutamicum*, *Corynebacterium ammoniagenes*, *Corynebacterium callunae* and *Streptomyces lividans*.

25. (currently amended) A process for producing compound (II-a) or compound (II-b), wherein the transformant according to claim 22, a culture of the transformant, or a treated product of the culture is used as an enzyme source, and the process comprises:

allowing compound (I-a) or compound (I-b) to exist in an aqueous medium in the presence of the enzyme source;

allowing compound (II-a) or compound (II-b) to be produced and accumulated in said aqueous medium; and

collecting compound (II-a) or compound (II-b) from said aqueous medium wherein, the compound (I-a) is a compound represented by the formula (I-a) :



the compound (I-b) is a lactone form of compound (I-a) and is represented by the

(I-b)

CC1=CC=C2C(=C1)C(=C(C=C2)OC(=O)R2)C(CCC(O)COC(=O)R1)O (II-a)CC1=CC=C2C(=C1)C(=C(C=C2)OC(=O)R2)C3=CC=CC=C3C(C=C3)OCC4OCC(=O)O4 (II-b)

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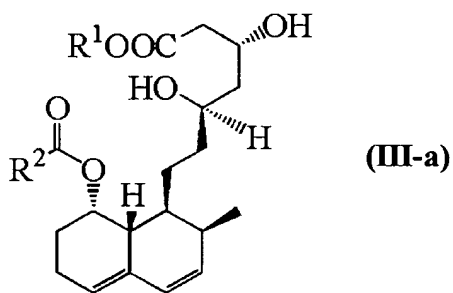
treated with a surfactant, cells treated with an enzyme, cells treated by ultrasonication, cells treated by mechanical milling, cells treated by solvent, a protein fraction of a cell, and immobilized cells.

26. (currently amended) A process for producing compound (IV-a) or compound (IV-b), wherein the transformant according to claim 22, a culture of the transformant, or a treated product of the culture is used as an enzyme source, and the process comprises:

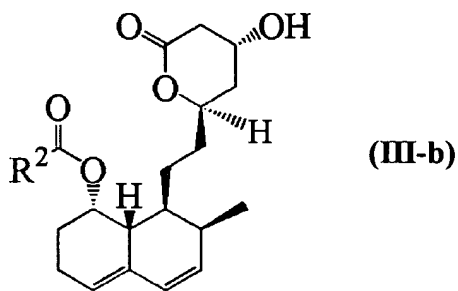
allowing compound (III-a) or compound (III-b) to exist in an aqueous medium in the presence of the enzyme source;

allowing compound (IV-a) or compound (IV-b) to be produced and accumulated in said aqueous medium; and

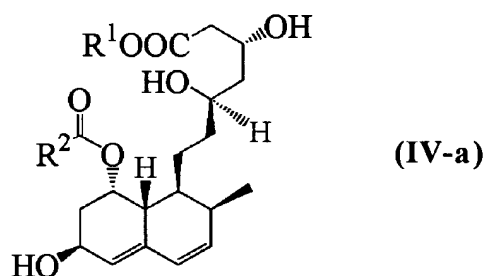
collecting compound (IV-a) or compound (IV-b) from said aqueous medium wherein, the compound (III-a) is a compound represented by the formula (III-a) :



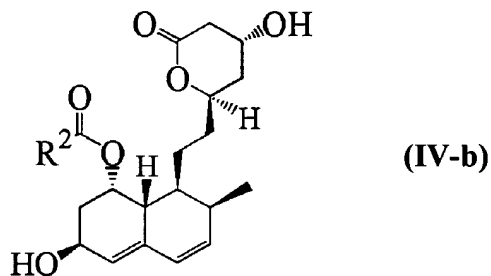
the compound (III-b) is a lactone form of compound (III-a) and is represented by the formula (III-b):



the compound (IV-a) is a compound represented by the formula (IV-a):



the compound (IV-b) is a lactone form of compound (IV-a) and is represented by the formula (IV-b):



and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R² represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl; and wherein the treated product of the culture of the transformant is a treated product selected from cultured cells, dried cells, freeze-dried cells, cells

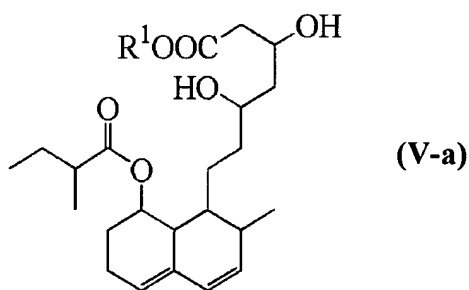
treated with a surfactant, cells treated with an enzyme, cells treated by ultrasonication, cells treated by mechanical milling, cells treated by solvent, a protein fraction of a cell, and immobilized cells.

27. (currently amended) A process for producing compound (VI-a) or compound (VI-b), wherein the transformant according to claim 22, a culture of the transformant, or a treated product of the culture is used as an enzyme source, and the process comprises:

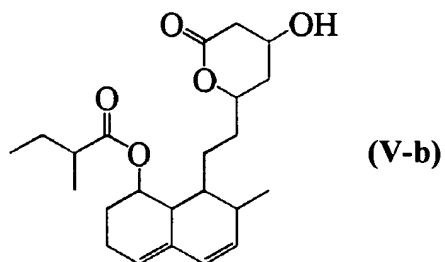
allowing compound (V-a) or compound (V-b) to exist in an aqueous medium in the presence of the enzyme source;

allowing compound (VI-a) or compound (VI-b) to be produced and accumulated in said aqueous medium; and

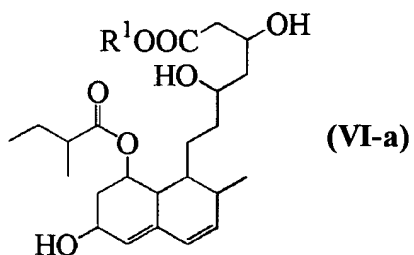
collecting compound (VI-a) or compound (VI-b) from said aqueous medium wherein, the compound (V-a) is a compound represented by the formula (V-a):



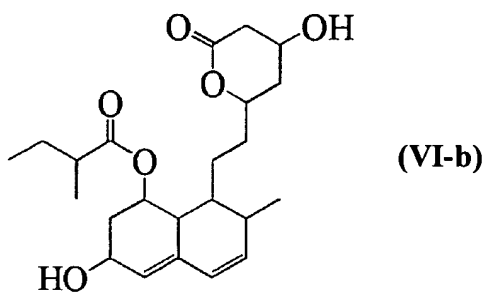
the compound (V-b) is a lactone form of compound (V-a) and is represented by the formula (V-b):



the compound (VI-a) is a compound represented by the formula (VI-a):



the compound (VI-b) is a lactone form of compound (VI-a) and is represented by the formula (VI-b):



and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal; and wherein the treated product of the culture of the transformant is a treated product selected from cultured cells, dried cells, freeze-dried cells, cells treated with a surfactant, cells treated with an enzyme, cells treated by ultrasonication, cells

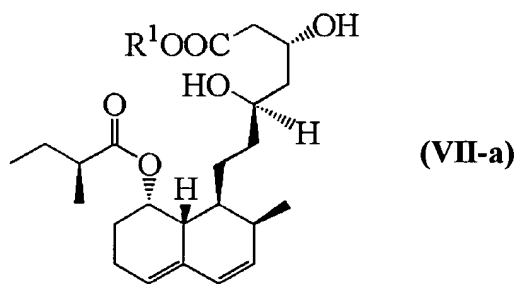
treated by mechanical milling, cells treated by solvent, a protein fraction of a cell, and immobilized cells.

28. (currently amended) A process for producing compound (VIII-a) or compound (VIII-b), wherein the transformant according to claim 22, a culture of the transformant, or a treated product of the culture is used as an enzyme source, and the process comprises:

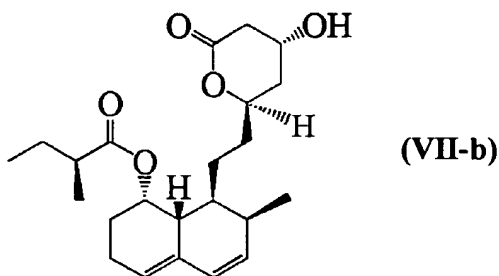
allowing compound (VII-a) or compound (VII-b) to exist in an aqueous medium in the presence of the enzyme source;

allowing compound (VIII-a) or compound (VIII-b) to be produced and accumulated in said aqueous medium; and

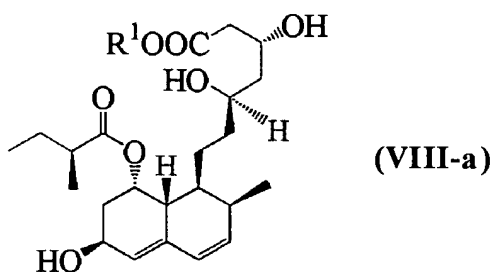
collecting compound (VIII-a) or compound (VIII-b) from said aqueous medium wherein, the compound (VII-a) is a compound represented by the formula (VII-a):



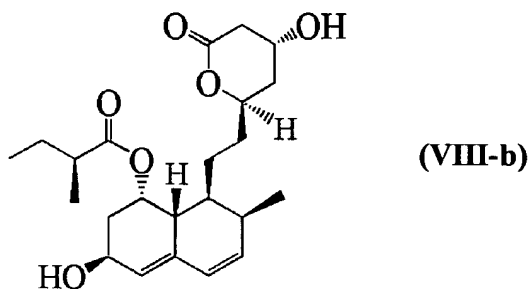
the compound (VII-b) is a lactone form of compound (VII-a) and is represented by the formula (VII-b):



the compound (VIII-a) is a compound represented by the formula (VIII-a):



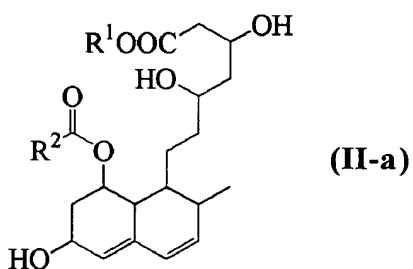
the compound (VIII-b) is a lactone form of compound (VIII-a) and is represented by the formula (VIII-b):



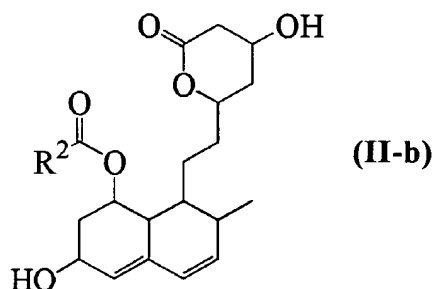
and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal; and wherein the treated product of the culture of the transformant is a treated product selected from cultured cells, dried cells, freeze-dried cells, cells treated with a surfactant, cells treated with an enzyme, cells treated by ultrasonication, cells

treated by mechanical milling, cells treated by solvent, a protein fraction of a cell, and immobilized cells.

29. (previously presented) The process according to claim 25, wherein the compound (II-b) is obtained by forming a lactone from compound (II-a), the compound (II-a) is a compound represented by the formula (II-a):

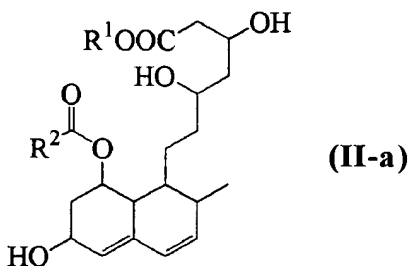


the compound (II-b) is a lactone form of compound (II-a) and is represented by the formula (II-b):

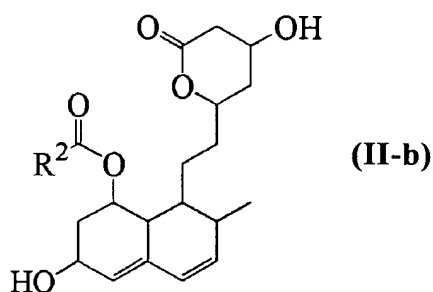


and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R² represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl.

30. (previously presented) The process according to claim 25, wherein the compound (II-a) is obtained by opening the lactone ring of compound (II-b), the compound (II-a) is a compound represented by the formula (II-a):



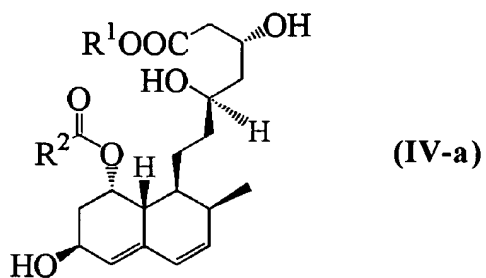
the compound (II-b) is a lactone form of compound (II-a) and is represented by the formula (II-b):



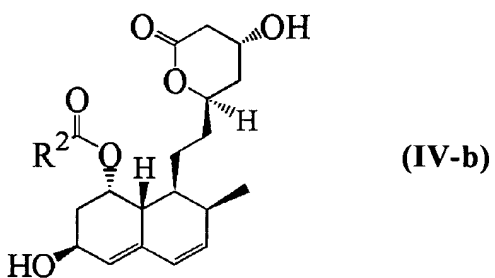
and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R² represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl.

31. (previously presented) The process according to claim 26, wherein the

compound (IV-b) is obtained by forming a lactone from compound (IV-a), the compound (IV-a) is a compound represented by the formula (IV-a):

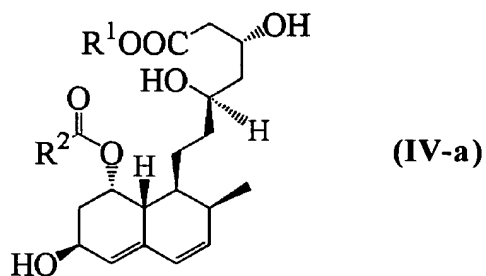


the compound (IV-b) is a lactone form of compound (IV-a) and is represented by the formula (IV-b):

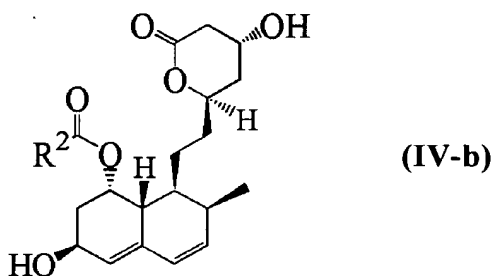


and wherein R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R^2 represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl.

32. (previously presented) The process according to claim 26, wherein the compound (IV-a) is obtained by opening the lactone ring of compound (IV-b), the compound (IV-a) is a compound represented by the formula (IV-a):

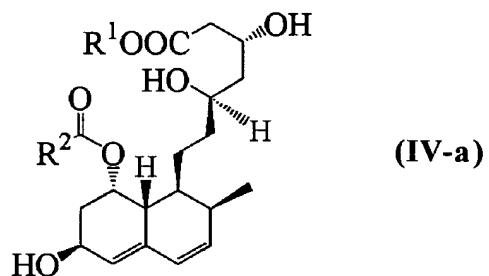


the compound (IV-b) is a lactone form of compound (IV-a) and is represented by the formula (IV-b):

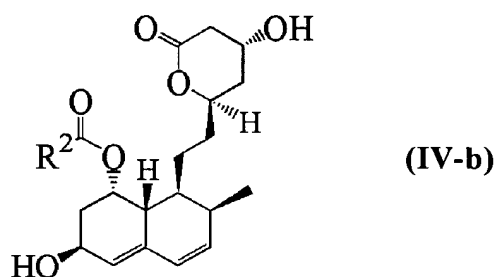


and wherein R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R^2 represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl.

33. (previously presented) The process according to claim 27, wherein the compound (VI-b) is obtained by forming a lactone from compound (VI-a), the compound (IV-a) is a compound represented by the formula (IV-a):

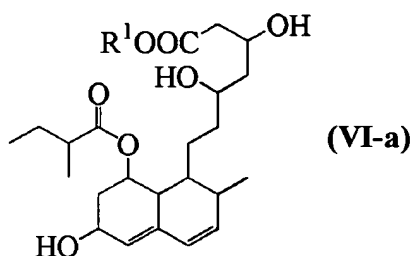


the compound (IV-b) is a lactone form of compound (IV-a) and is represented by the formula (IV-b):

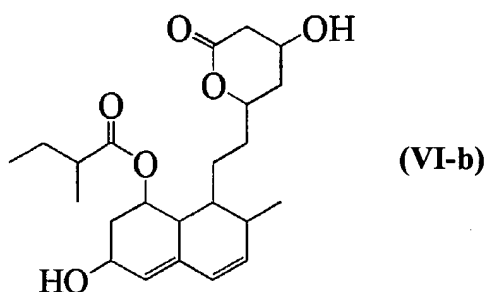


and wherein R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R^2 represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl.

34. (previously presented) The process according to claim 27, wherein the compound (VI-a) is obtained by opening the lactone ring of compound (VI-b), the compound (VI-a) is a compound represented by the formula (VI-a):

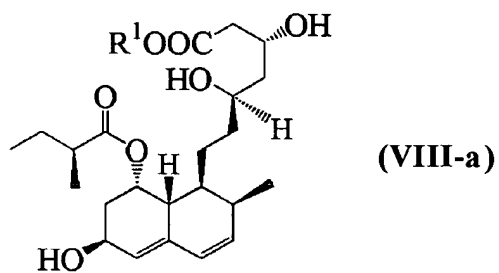


the compound (VI-b) is a lactone form of compound (VI-a) and is represented by the formula (VI-b):

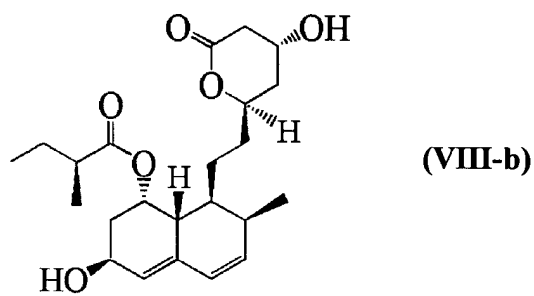


and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal.

35. (previously presented) The process according to claim 28, wherein the compound (VIII-b) is obtained by forming a lactone from compound (VIII-a), the compound (VIII-a) is a compound represented by the formula (VIII-a):

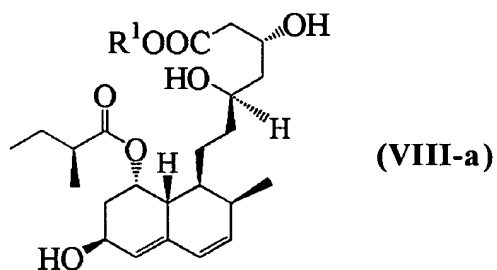


the compound (VIII-b) is a lactone form of compound (VIII-a) and is represented by the formula (VIII-b):

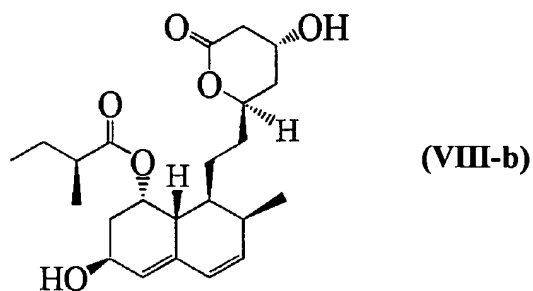


and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal.

36. (previously presented) The process according to claim 28, wherein the compound (VIII-a) is obtained by opening the lactone ring of compound (VIII-b), the compound (VIII-a) is a compound represented by the formula (VIII-a):



the compound (VIII-b) is a lactone form of compound (VIII-a) and is represented by the formula (VIII-b):

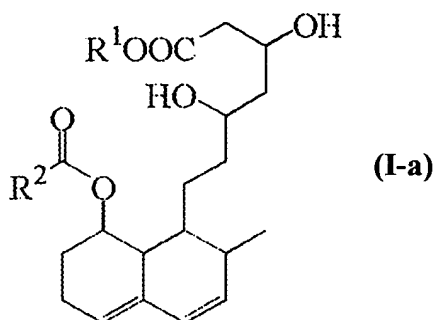


and wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal.

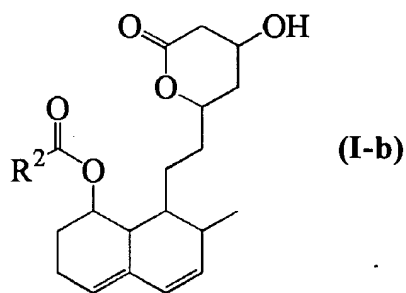
37. (canceled)

38. (currently amended) A process for producing a protein, which is derived from a microorganism belonging to the genus *Bacillus*, and has an activity of producing compound (II-a) or compound (II-b) from compound (I-a) or compound (I-b),

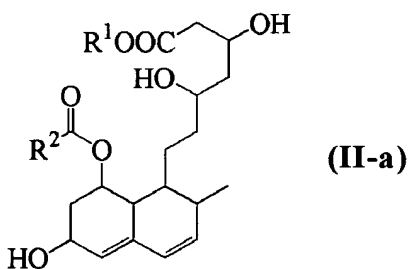
wherein the compound (I-a) is a compound represented by the formula (I-a):



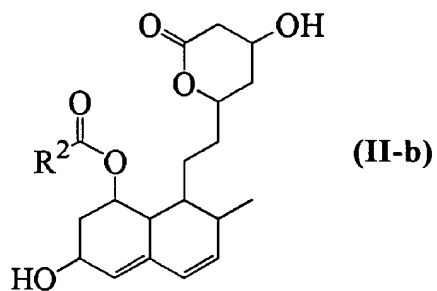
the compound (I-b) is a lactone form of compound (I-a) and is represented by the formula (I-b):



the compound (II-a) is a compound represented by the formula (II-a):



the compound (II-b) is a lactone form of compound (II-a) and is represented by the formula (II-b):



wherein R¹ represents a hydrogen atom, a substituted or unsubstituted alkyl, or an alkali metal, and R² represents a substituted or unsubstituted alkyl, or a substituted or unsubstituted aryl, which comprises culturing a transformant obtained by introducing a recombinant DNA vector comprising the DNA having the nucleotide sequence shown by SEQ ID NO: 2 in a medium; producing and accumulating the protein according to claim 1 in the culture; and collecting said the protein from said culture.

39. (canceled)